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absurdity of supposing that the canals could be looked upon as artificial waterways in themselves, for they must be at least 20 miles in diameter to be discerned at all, but he suggested that they might indicate the lines of canals, the visible broadening out being due to cultivated tracts on either side of the main waterway, which should show a darker and greenish tinge. But, if not canals, they might indicate the lines of roads cut straight across the deserts from one centre of population to another. It would be obviously the aim of any inhabitants to make the roads as straight as possible in a nearly waterless planet. Then, if tracts of country were cultivated and made to support vegetation, surely the districts immediately surrounding the centres of population (the dots seen where the canals intersect) would first be attended to, and afterwards substantial strips of desert at each side of the roads would be reclaimed and covered with vegetation. This is one hypothesis which might help to explain the suspiciously artificial-looking and designed appearances of the so-called canals of *Mars*.

The remaining question, of the relative brightness of the solar reflection when *Mars* is in other positions than in opposition, may be shortly dealt with ; for the relative configuration of the orbits of the Earth and *Mars* is such that two lines, one joining the Sun and *Mars* and the other joining the Earth and *Mars*, never enclose a greater angle than about 50°, so that the maximum angle of incidence and reflection would be 25°. But it has been proved that the percentage of light reflected from water at that angle is not very appreciably greater than that reflected perpendicularly. The contrast between the solar reflection and the gibbous disc of *Mars* would thus remain much about the same as when in opposition.

Photographs of the Spectrum of the Ball and Rings of Saturn.

(*Letter to the Secretary.*)

E. W. Maunder, Esq.,
Secretary of the Royal Astronomical Society,
London, England.

Dear Sir,—I send you with this a photograph of the spectrum of *Saturn*, which it may interest some of the Fellows of the Society to examine. The fact that the lines in the spectra of the ansæ do not follow the direction of the planetary lines, but are very slightly inclined in the opposite direction, is a spectroscopic proof of the meteoric constitution of the ring, as I have explained at length in the May number of the *Astro-physical Journal*. Although the positive enlargement which I send is less satisfactory than the original negative viewed under a microscope, the feature mentioned above can be seen without difficulty.

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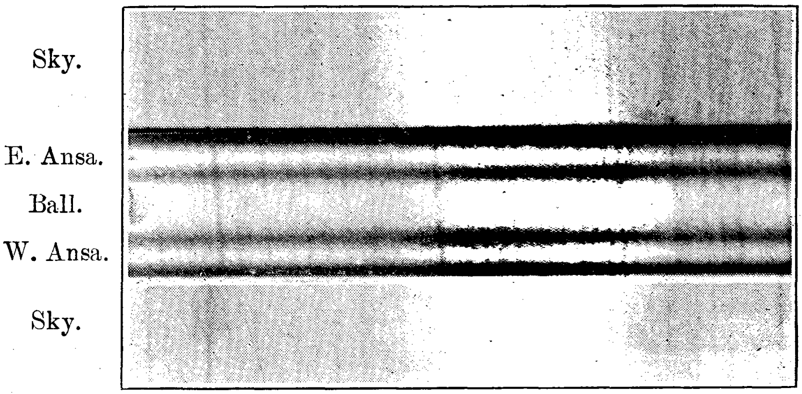
To prevent the eye from being influenced by the slope of the planetary lines, it is best to cover the central spectrum with a narrow slip of paper.



Spectrum of Saturn, 1895 April 19.
Enlarged 15 diameters from the original negative taken at the Allegheny Observatory, by J. E. Keeler.

The large relative displacement of the planetary and sky spectra is due to the fact that the comparison spectrum was photographed the next morning after the exposure to the planet, and at a quite different temperature. It does not affect the value of the photograph for this particular purpose. The exposures were, *Saturn* 2 hours, and sky 4 minutes. As the sky spectrum was too dense, a bar was placed across the plate during part of the exposure (in making the positive), and some horizontal markings resulted, which are not on the original negative.

Yours very truly,

James E. Keeler.

Observations of Jupiter. By W. F. Denning.

The following are a few results of observations of *Jupiter* made between 1894 November 5 and 1895 May 10 with a 10-inch reflector, powers 252 and 312.

The red spot was seen on several occasions, but it was extremely faint, especially at its preceding end. Its south side appeared to be connected with a grey belt. Between 1894 November 25 and 1895 May 10 I found a mean period of

$$9^{h}\ 55^{m}\ 41^{s}{\cdot}2 \text{ (401 rotations).}$$

This is slightly more ($0^{s}{\cdot}6$) than the period ($9^{h}\ 55^{m}\ 40^{s}{\cdot}63$) on which Mr. Marth's zero meridian System II. is based, and it

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